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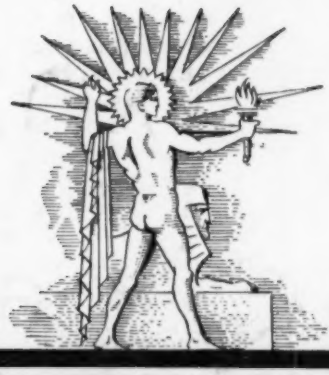
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



April 5, 1941

Atom Smasher

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A SCIENCE SERVICE PUBLICATION

Do You Know?

Crisfield, Md., packs and ships more *crab meat* than any other locality in the world.

Oranges contain practically no starch, and therefore do not ripen further after they are picked.

"Blitzing" peach orchards with mass liberations of *parasites* is being tried in efforts to fight fruit moths.

New and old *potatoes* may differ in flavor, but nutritionists have not found much difference in food value.

Soybean oil is likely to prove useful in paint for traffic lines, now that science has found out how to make it dry quickly.

A new ship for North and for South American travel will be the first ocean liner completely *air-conditioned* in all passenger cabins.

One king of ancient Egypt, says an Egyptologist, had represented on his tombstone his favorite *dogs:* Gazelle, Greyhound, Black and Fire-Pot.

Pennsylvania is having a "back-to-the-country" trend in *population,* but not back to the land, because little towns rather than farms are the goal.

Reminiscent of *war gardens* of 1918, demonstration vegetable gardens are being planted in four New York counties by state agricultural agents this spring.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

ARCHAEOLOGY

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PSYCHOLOGY-PHYSIOLOGY

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PUBLIC HEALTH

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What odorless, unnoticeable mist may be used to sterilize the air of raid shelters? p. 223.

RADIO

Who listens consistently to foreign propaganda broadcasts? p. 216.

Sugar maple trees with large tops yield sap of about 1% higher sugar content than other trees, according to an experiment.

Careless handling between henhouse and retail counter probably does more to lower *egg* quality than anything else, says a government agricultural writer.

Outstanding features of the General Motors *Futurama* at the New York World's Fair will be installed at New York's Museum of Science and Industry.

New zoo buildings in Buffalo include a barn for a *barnyard exhibit.*

Evolving a machine to crack *coyol* nuts has given Mexico a new industry—the nuts, growing on a palm tree, offer a substitute for coconut oil in soaps and margarines.

Intended to check wind erosion, wild plum and chokecherry *thickets* in North Dakota are also providing fruit for jelly making and shelter and food for useful birds.

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MEDICINE

New Sulfa Drug May Prevent As Well As Cure Meningitis

War-Censor-Delayed Reports Tell of Significant Advances Toward Control of Diphtheria As Well

HOPE that sulfadiazine, one of the newest of the sulfa drugs, may prove the means of preventing as well as curing meningitis appears in a war-censor-delayed report just made public.

Significant advances towards the control of diphtheria and scarlet fever as well as meningitis, were made in Halifax, N. S., this winter during epidemics which threatened to slow that prize port's steady flow of supplies to embattled Britain. The war plague fight was made by 11 American men and women comprising the Harvard Medical School expedition. Under the leadership of Dr. J. Howard Mueller, this expedition spent four weeks in the disease-ridden city studying these infections and helping local authorities to bring them under control.

The story of the expedition can be told now because the menacing epidemics have been checked; because measures have been taken which make their recurrence unlikely; and because the advances made are going to be used to strengthen America's defenses against disease.

Sulfadiazine proved the hero in the meningitis situation. This disease was never as rampant in Halifax as was diphtheria, but it was a constant smouldering threat. The new sulfa drug was used by Dr. John H. Dingle, of the Harvard expedition, to control the situation. It appeared "to have certain advantages" over other sulfa drugs used against meningitis and was felt to be especially valuable in solving the important problem of carriers of the disease.

This is because sulfadiazine not only helps the patient to get well but apparently swiftly banishes the meningitis germs from his nose and throat, where they may lurk long after he is well, constituting a hazard to other persons.

"The suggestion is obvious," Dr. Mueller reported, "that healthy carriers may be similarly cleared up."

This theory could not be verified experimentally in Halifax but it has since been confirmed by an Ottawa physician who studied troops in that area. It is an entirely new idea and one completely contrary to the experience of the last war. It may, doctors believe, be the beginning of the end of the carrier problem in meningitis.

A new and better technic for diagnosing meningitis which has certain advantages making it "particularly suitable for military use under field conditions" was developed through a new culture medium for growing meningitis germs prepared by Dr. Mueller.

A better method for dealing with the problem of protecting adults against diphtheria and more knowledge about scarlet fever, including discovery of a new strain of scarlet fever germs, are other advances made by the expedition.

The official report is being forwarded to the Surgeon General of the U. S. Public Health Service so that this nation may profit from the Halifax experience in fighting war plagues.

Science News Letter, April 5, 1941

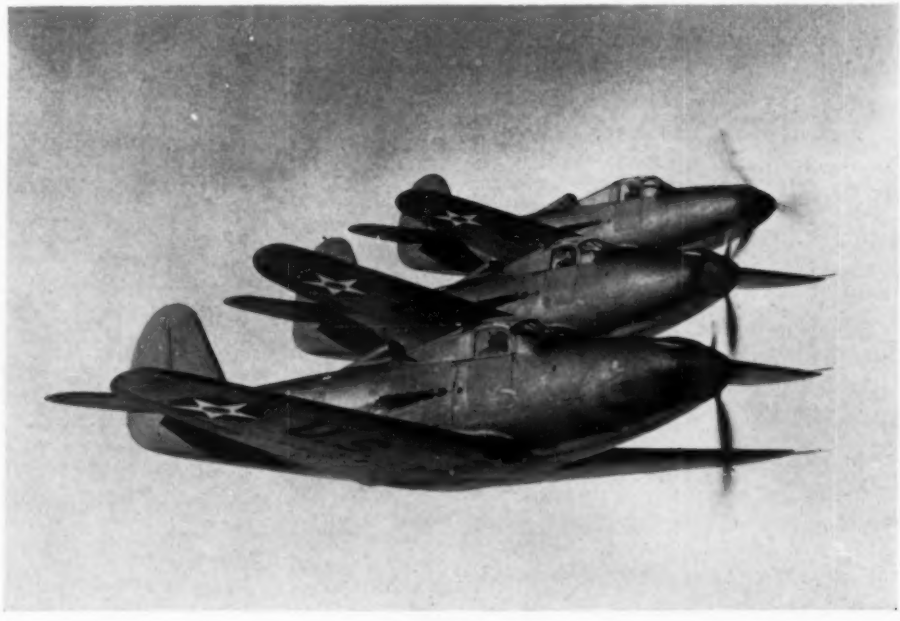
PUBLIC HEALTH

Tuberculosis Is Fought Among Defense Workers

UNCLE SAM is going to great lengths to make sure that among the million or more young men in army training camps there will be none whose health is not good enough to stand the rigorous life and activities of a soldier in training.

Behind the training camp front is another vast and growing army of men and women working in the factories that produce defense weapons. They also are subject to certain strains on health and endurance, strains which will be increased by the speed-up of production for defense. These extra strains, plus the fact that many of the industrial workers will be living in crowded quarters, at least temporarily, and may be deprived of certain necessities by mounting prices, are conditions that threaten health in many ways and particularly carry the threat of increased spread of tuberculosis.

The way to stop the spread of tuberculosis is to find the people who have the disease and keep them from contact with others while the disease is in the infectious stage. In the early stages of



PRECISION

This difficult close-order flying maneuver is being executed by three Army Air Corps flyers from Selfridge Field who had never seen this Aeracobra Interceptor Pursuit plane until the day before. The photograph was taken by the Bell Aircraft Corp., who certify: "This is an actual photograph, no retouching, no super-imposing, so help us!"

this disease, however, the patient often does not know he has it. In fact, he may not even feel sick. So he fails to get treatment for himself at an early stage when it can be most helpful, and fails to stop the spread of his germs to other persons.

In this early stage, long before the patient is coughing or spitting blood or having night sweats or feeling tired, X-ray pictures can detect the disease. Consequently, tuberculosis authorities urge more widespread use of X-rays to find the patients who need treatment and to check the spread of tuberculosis.

The National Tuberculosis Association is conducting its annual Early Diagnosis Campaign, to remind people generally of the importance of finding the unsuspected tuberculosis patients in every community and every home.

One place to start looking for unsuspected tuberculosis, the association believes, is in the army of defense industry workers.

Science News Letter, April 5, 1941

MEDICINE

Sulfa Drugs Able to Cure by Chemical Warfare in Germ

Believed Antagonistic To Chemical Playing Role In Bacterial Enzyme System Essential To Germ's Life

SULFANILAMIDE and the other sulfa drugs cure by waging and winning chemical warfare within the bodies of invading disease germs. This explanation of how the sulfa drugs probably work was suggested in a Sigma Xi lecture at Mississippi State College by Dr. Perrin Long, professor of preventive medicine, Johns Hopkins Medical School.

Dr. Long is an authority on the sulfa drugs, being one of the first American physicians to use them and the man chiefly responsible for introducing Prontosil, granddaddy of the sulfa drugs, to this country.

"Two main theories as to the mode of action of sulfanilamide have been evolved," Dr. Long said.

He favors what he calls the "inhibitor theory," according to which chemical warfare is waged in the invading disease germ's body.

The warfare is between the sulfa drug and one or both of two other chemicals, para amino benzoic acid and methionine. The first of these has been found in yeast and is very likely present in all living things, including bacteria. Scientists have recently found that it has to a high degree the power of inhibiting or stopping sulfanilamide's action against disease germs. It does this both in the test tube and in the infected animal.

Methionine is one of the essential amino acids from which proteins are built. It is found in normal blood and probably is also present in body tissues. Like para amino benzoic acid, methionine can stop the bacteriostatic activity of sulfanilamide.

One or both of these chemicals may play a role in some enzyme system by which bacteria digest and get nourishment from their food. Sulfanilamide, according to Dr. Long's theory, must compete with one or both of these other chemicals for a place in the bacterial enzyme system. If it wins the chemical war and gets to the enzyme system first, the germs cannot flourish and the patient can overcome them and get well.

Science News Letter, April 5, 1941

PSYCHOLOGY

Psychologists Honored For Research on Vision

ONE of the highest honors in the field of psychology, the Howard Crosby Warren Medal, was awarded by the Society of Experimental Psychologists to Prof. Clarence H. Graham, of Brown University.

The award was made for Prof. Graham's notable researches in the field of vision. He has been particularly interested in exactly what happens to the eyes and to the nerves involved in vision when light strikes the eye or when the intensity of light suddenly changes — as when you step from bright sunshine into a darkened theater.

Prof. Graham was recently appointed

HONORED

Dr. Clarence H. Graham, of Brown University, shown here at work in his laboratory, was awarded the Howard Crosby Warren Medal for his distinguished research in the psychology of vision.

to the National Research Council's Committee on Sensory and Perceptual Problems, which is a subcommittee of the Emergency Committee on Psychology devoted to defense problems.

Science News Letter, April 5, 1941

PSYCHOLOGY

German Army Psychologists Make Effective Use of Science

Peculiar Notions of Nazi Ideology Are Disregarded When It Comes to Selection and Training in Army

GERMANY has been using scientific psychology as an effective military weapon in the army and "fifth column" for at least five years. Even Freudian doctrines have been put to use, despite public condemnation of psychoanalysis in Germany.

This is revealed by a clever piece of scientific detective work done for our own defense program by Dr. H. L. Ansbacher, of Brown University. As a contribution to the work of the Emergency Committee in Psychology, Dr. Ansbacher has made a thorough search of every available scrap of writing published by Germany's corps of military psychologists.

Individually, these publications escaped the attention of the outside world, because as contributions to science they were insignificant. But pieced together, they disclose a unified approach to the problem of applying psychology to military problems in a very effective way.

Peculiar notions of Nazi spokesmen on race psychology and the influence of physical makeup on the mind are thrown into the discard by the German army when it comes to making practical military use of this science, Dr. Ansbacher found.

"The honest research psychologist must admit," said Dr. Max Simoneit, regarded as the dean of German military psychology, "that nature in some cases upsets his rules of types."

Neither do totalitarian ideas regarding the unimportance of the individual apply in Germany to the selection of German army officers or to the training and discipline of the army, Dr. Ansbacher's survey revealed.

In fact, the greatest danger for an army is seen by Dr. Simoneit in its becoming a mass; the greatest asset, superior leadership.

"Our hope for victory is founded on intellectual superiority of the German officer," Dr. Ansbacher quotes this German leader as saying.

Although some psychologists in the German army favor strictest discipline according to traditional Prussian fashion, a newer viewpoint is expressed by Dr. W. Hansen, German military psychologist. He favors individualized training, Dr. Ansbacher found.

"The days of blind obedience are gone," Dr. Hansen declared in a psychological journal in 1938. "Mere subordination would not be adequate to modern fighting conditions. Through machine gun nests, tanks, and airplanes an army fights in such small units that every single man must furnish his own inspiration and be his own officer.

"Therefore the active participation of the individual in the training process must be elicited. The sergeants must be educated to understand the individual and deal with him accordingly."

Digging further through the writings of German psychologists revealed that sergeants are actually educated along these lines.

In the German army, it is the psychologists who select the commissioned officers, not the officers who pick psychologists. The psychological examination for commissioned rank lasts two full days and is conducted by a board consisting of two officers, one physician, and three psychologists. This is the main task of German military psychology.

They try, in this comprehensive examination, to evaluate the candidate on general intelligence (loaded on the practical side), use of willpower, planning, attention, clear thinking under physical and emotional stress, energy, perseverance, willingness to try with all one's might and to the limits of capacity, ability to command or manage people, and total personality as revealed by life history.

During the examination, motion pictures of the candidate are secretly made and studied to reveal his facial expression while thinking and under various kinds of strain. Even his handwriting and voice are subjected to scrutiny for any clues they may give to his personality.

According to a special report to Secretary of the Navy Knox, the military psychologists also train military spies, the Gestapo and "fifth column" agents for service abroad.

This part of the psychological laboratory has been kept secret, but Dr. Ansbacher was able to find references to two books by Dr. A. Blau, who seems to head this work. One is an official handbook on propaganda, the other on "Psychological Warfare."

Other obscure papers reveal how German military psychologists operated to obtain information about the mental make-up of other peoples.

The psychologist was directed to study individuals of a foreign nation by intimate living among them as a friend. He must speak their language. But he must not live so long in the foreign land that he "loses his perspective." And furthermore, he must write his report after he has returned to German soil.

This is how the Balkan people are characterized on the basis of such individual psychological studies, together with community studies and analysis of statistical material:

"Extremely conservative, very superstitious, strongly devoted to their families, governed by home rule to a great extent, and seeing in work no other satisfaction than profit. In spite of different languages and governments, they form an essentially homogeneous group, distinct as a whole from the neighboring groups."

And here is a portrait of the English people as seen through the eyes of the German military psychologist who drew on 19th Century literature and documents for his analysis:

"Strong spirit of individual enterprise, initiative, sense of responsibility, and striving for personal freedom and self-government combined with strong national unity. The economic aspect takes the foreground, the military the background, and an unshakable belief in the right of the English people to rule is supreme."

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Naturalists, who found a mule *deer* fawn curled-up motionless in a "freeze" pose for defense in its mother's absence, photographed the infant for 30 minutes, and it seemed not to move even an ear and kept eyes wide open.

GENERAL SCIENCE

America Must Realize Nazi Terror Opposite of Liberty

David Cushman Coyle Describes Difference Between The Planning of Dictatorship and That of America

URGING half-awake America not to play into Hitler's hands by carelessly hurling the name "dictator" at American officials and by lightly using the word "purge" when we mean merely firing—not shooting—David Cushman Coyle, engineer-economist has strongly advised Americans to sharpen up their blurred picture of the real difference between democracy and Europe's New Order of Terror.

Mr. Coyle spoke in Washington before the Academy of World Economics in joint session with the national social science honor society, Pi Gamma Mu.

Citing the Terror as a prime characteristic of life in the New Order of Europe, Mr. Coyle said that the Terror is not such incidents as ordinary harmless people having to stand by while friends and relatives are beaten and killed, or dragged to an unknown fate.

"The Terror," declared Mr. Coyle, "is an overhead condition that draws together all these individual acts of cruelty into a closed trap, a cage from which there is no escape. The people living under the Nazi shadow cannot get out."

Nazi Nordics themselves are entrapped, surrounded by waves of hate, continued Mr. Coyle.

A necessary feature of dictatorship, the Terror, he declared, is so essentially emotional that the only effective medium to make it understood is drama. Moving pictures, he prophesied, will have major importance in explaining the Terror and its opposite, Liberty, to Americans, if our democracy is roused in time to survive.

Offering a simple definition of democracy, to end confused arguments as to whether to call Greece, China, and England democracies, Mr. Coyle said:

"I would suggest that democracy means to us a way of private and public life that is intended to meet our standards of decency and good will."

Pointing out that democracy does not have to be perfect to be democracy, he advocated clearer understanding of our country's ideals and good traits, "to avoid succumbing to Hitler's efforts to create confusion among us."

"With all our faults," said Mr. Coyle, "we still believe in decency and honesty and sportsmanship. We do not in cold blood believe in kicking any one when he is down. We believe that equality of opportunity is the birthright of all Americans, even if we neglect to provide for it.

"We are unselfish at times, and quick to dig into our pockets to help any victim of disaster who happens to arouse our imagination. Our worship of money is half-hearted, and we often fall away into idealistic longings for something better, particularly for the affection and respect of our fellow-citizens.

"Let us not be blind to our own faults or to our virtues, for we may as well recognize that to half the people of the world we seem, at a distance, to be living in a heaven on earth, a land of hearts' desire."

Americans were advised to try to understand why the Nazi system is strong.

"Nazism," he pointed out, "embodies a strong form of engineering, a strong economic organization and a strong religion, all of which we must meet and overcome if we can."

Nazi engineering he described as having the strength of central planning, with no nonsense allowed. Workers cannot strike. Business men cannot dicker about prices. Producers of material cannot raise prices, or close down for lack of profits. Protecting personal interests is not allowed.

Centralization of authority in Nazi Germany is not technically very different from the ordinary technical organization of any large engineering project, such as building a great dam in our country, explained the engineer speaker. The difference is that in a free country, any one dissatisfied can resign, be fired, or refuse a contract, and start elsewhere. In Nazi conditions, there is no escape.

Emphasizing that Nazi engineering applied to a whole nation is efficient, as our own engineering jobs on a smaller scale are efficient, Mr. Coyle said that this gives the Nazis the jump on the whole world in total national engineering. But, he added, the price is still to be paid, because the "no escape" feature has led to killing and imprisoning men, and has aroused hate and fear.

"In the long run, we believe, that kind of engineering will not hold its efficiency," he concluded. "The problem, of course, is to resist its terrific striking power in the short run, while its efficiency is high and the penalty for its cruelty has not yet fallen due."

Nazi economics benefited by being free of the superstitious phobia of economy that paralyzed the larger democracies during the years of Hitler's rise, Mr. Coyle stated, adding: "While the United States wasted thirty to fifty billion dollars of productive power a year for fear of spending, Hitler built his tremendous war machine by simply keeping every one on the job."

Fatal weakness in this system, is seen as Hitler's inability to make every one work for any such harmless purpose as to raise the general standard of living. This the democracies alone are capable of learning and achieving.

Describing the Nazi religion as "low but vital," Mr. Coyle said:

"Nothing can stand against even the lowest form of religious brotherhood except a better and higher form."

Science News Letter, April 5, 1941

PHYSICS—MUSIC

Continuous Broadcast of Frequency Signals Resumed

AGAIN it is possible to get a standard musical note of "A" by radio, with which you can tune pianos and other musical instruments.

All you need is a shortwave radio receiver, capable of tuning the five-megacycle band. On that frequency, National Bureau of Standards' station WWV, operating 24 hours a day, transmits the musical note of "A" above middle "C", which is 440 cycles per second. In addition, there is a pulse each second, heard as a faint tick. Every five minutes, the note is interrupted for a minute to make the announcement, in telegraphic code.

The former transmitter of WWV was destroyed by a fire last November, which necessitated cessation of these broadcasts. They are now carried on a temporary transmitter of one kilowatt power. This has a daytime range of about 500 miles in summer and 1000 miles in winter, while at night it can be received through most of the country.

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ASTRONOMY

"Haze of Stars" Found Surrounding Milky Way

Sun With Its Attending Planets Is Located About 32,000 Light Years From Our Galaxy's Center

A GLOBULAR "haze of stars" surrounds our grindstone-shaped Galaxy, or Milky Way system, in which the sun, with its attending planets, is located about 32,000 light years from the center.

These are two of the facts about the stellar systems called galaxies, announced by Dr. Harlow Shapley, director of the Harvard College Observatory, in a new book, *Galactic and Extragalactic Studies,* just issued by the Observatory. It is made up of 21 papers by Dr. Shapley, some with the collaboration of members of his staff, from 1933 to 1940.

Many of the researches were made with the aid of Cepheid variable stars, which vary in a characteristic manner, mostly in a period less than 40 days. The longer the period, the brighter, on the average, is the star. Thus by measuring its period, its actual brightness, or "candlepower," may be determined. Knowing how bright it is, and how bright it looks, the distance may be calculated.

In one of the studies, Dr. Shapley makes a new determination of the relationship between the period and luminosity of Cepheids, based on more complete observations than those of the past, and shows that it differs very little from that previously used. However, the curve he shows for this relation reveals a considerable scattering of some of the star brightnesses.

"This," he declares, "demands much further close investigation; at present it appears that occasionally large real differences in luminosity occur for stars with periods of equal length."

Probably of most interest to the layman is Study III, by Dr. Shapley and Dr. John S. Paraskevopoulos, superintendent of the Observatory's Boyden Station, at Bloemfontein, South Africa. This reproduces photographs taken there with the 60-inch reflecting telescope, of thirty interesting galaxies, nebulae and clusters, in the southern skies. Two of them are shown on this page.

Another paper deals with the linear dimensions of 125 galaxies, which are like our Milky Way system, but outside its limits. None of them seem to be as large as ours, but the one in Andromeda, which is faintly visible to the naked eye, and among the nearest, seems to be the biggest.

The average galaxy, he says, "is a little less than two kiloparsecs in diameter." The kiloparsec is an astronomical unit of distance, equal to 3,260 light years—that is, the distance that a beam of light, travelling 11,000,000 miles a minute, can go in 3,260 years. The Andromeda galaxy, it is stated, seems to be about 12 kiloparsecs in diameter, while our own is more like 30. The sun is about 10 kiloparsecs from the center of ours.

This study also indicates the density of the galaxies in space. This corresponds, he says, "to about 500 galaxies in the unit cube, which is one million light years on a side."

Dr. Shapley explains in the introduction to the book that the studies were possible as a result of the establishment, at the Harvard Observatory, of a special bureau for galactic and extragalactic research, the expenses of which are "borne in part by the Associates of Physical Sciences in Harvard University."

"The Galactic Bureau," he states, "has grown gradually until it now requires more than half the time of four telescopes at the Boyden Station in South Africa and part of the time of three instruments at the Oak Ridge (Mass.) Station. It involves nearly the full-time activity of nine individuals in Cambridge, and the part-time work of a few others. So many workers are necessary because the discovery and studies of large numbers of variable stars are extremely laborious processes, and the metagalactic surveys include the determination of the positions and magnitudes of several hundred external galaxies on nearly every long-exposure plate."

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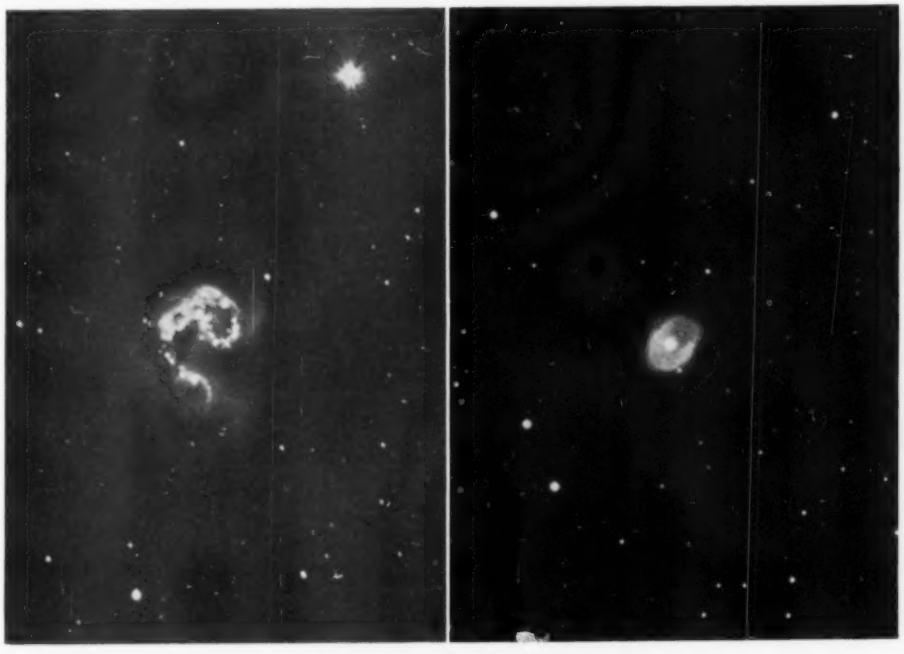
Russian fur farmers report success in breeding *sables* in captivity.



"RING-TAILED SNORTER"

Like a celestial pollywog is this curious object (left) in the constellation of Corvus, the crow, known familiarly among Harvard astronomers as the "ring-tailed snorter." It is a distant galaxy of stars, like our Milky Way system, though differing greatly in shape. Strange is the fact that it has a twin, a short distance away, of similar shape and brightness. Undoubtedy the two are related. To the right is the "eight burst" planetary nebula in the faint constellation of Antlia, the air pump. It is so called from the number of distinct arcs that can be detected in its boundary, not all of which are revealed in this reproduction. They suggest that the nebula may have orignated in a series of bursts from the star in the center.

RADIO

Government Listening Posts Record Foreign Propaganda

GOVERNMENT listening posts, where a continual watch of foreign short-wave radio broadcasts will be kept, are being established by the Federal Communications Commission and the Defense Communications Board.

To make sure that no subversive propaganda is missed, a staff of 350 technicians, translators, clerks, analysts and other experts will work in eight-hour shifts. Recordings will be made at the field stations, and the records sent to Washington for futher study. Since three-quarters of these broadcasts are in foreign languages, it requires an average of seven hours' translation and study for each hour of broadcast.

Science News Letter, April 5, 1941

ASTRONOMY

"Meteor" in Photograph Was Really an Airplane

WHAT Dr. Fred L. Whipple, astronomer at Harvard College Observatory and expert in meteors, recently thought was a rare photograph, turned out to be something quite different.

Hundreds of millions of these "shooting stars," as meteors are commonly called, enter the atmosphere of the earth daily, but only rarely does a camera happen to be pointed to the part of the sky where one appears. As part of a program of study, Harvard astronomers regularly set up photographic traps to catch them.

Similar cameras at the observatory headquarters in Cambridge, and the observatory at Oak Ridge, Mass., 25 miles away, are regularly directed to the same part of the heavens. When they record a meteor, the trail is against a different background of stars in the two pictures. From this displacement the height can be figured, a matter of fifty miles or more.

According to *The Telescope,* illustrated magazine published at the Harvard Observatory by the Bond Astronomical Club, the other day Dr. Whipple noticed what seemed to be a meteor trail on two plates, both of which were exposed at Cambridge, in cameras a few feet apart. Just out of curiosity, he measured the plate. The "meteor" was only a thousand feet overhead!

This would have been most sensational, except for the fact that it wasn't a meteor at all, but an airplane. The red light on the plane failed to record on the blue sensitive plate, only the green light made the trail.

So now the Harvard astronomers are wondering how in the future, on single exposures, they can tell a shooting star from an airplane.

Science News Letter, April 5, 1941

PSYCHOLOGY

Research in Aviation Psychology Being Surveyed

DISCOVERIES made by scientists in the psychology of aviation have been dug out of dusty archives, abstracted, classified and indexed ready for the instant use of Army, Navy and civil aviation officials by WPA workers in New York.

Altogether 10,000 research studies have been brought to light in this survey, which was made at the request of Dr. Dean Brimhall, director of research of the Civil Aeronautics Authority.

The WPA, in its Psychological Index project, has been making an index of titles of psychological research reports. Using this as a starting point, Prof. G. H. S. Razran, of Queens College, selected all the titles which concerned aviation psychology, hunted up the research reports, and prepared abstracts of them. Hitherto this work has been lost to scientists working in this field in connection with the defense program because there has been no way of tracing it through any index.

WPA workers have continued this work and it is hoped that they may be assigned to follow up this study and keep this indexing and abstracting service up-to-the minute for defense coordination of research.

Science News Letter, April 5, 1941

HORTICULTURE

Mildew-Proof Climber Rose Named For Stephen Foster

STEPHEN FOSTER, writer of many of America's favorite songs, is commemorated in the naming of a new hybrid climbing rose, with fine red flowers, which was originated at the University of Arkansas by Prof. H. R. Rosen. (*Science,* March 14) The new variety is highly resistant to powdery mildew, fungus disease that ruins many climbing roses, and it can also withstand severe winter cold.

Science News Letter, April 5, 1941

IN SCIEN

PHYSICS

Simple Altimeter for Auto Is Now on the Market

A SIMPLE altimeter for automobiles has been introduced, which attaches either to the windshield molding or the center post. It comes in three models, intended for different ranges of height. One reads up to 5000 feet in 100-foot divisions, the second to 10,000 feet with the same fineness, and the third, for really high country, to 15,000 feet, in 200-foot divisions. (*Taylor Instrument Co.*)

Science News Letter, April 5, 1941

MEDICINE

British Students Will Complete Training Here

SOMETIME this spring a group of English medical students, whose studies were interrupted by German bombs that destroyed schools and hospitals, will arrive in the United States. They will be the first contingent of the group whom the Rockefeller Foundation will help to finish their studies in American and Canadian medical schools.

The plan for this type of aid to Britain was announced by Raymond B. Fosdick, president of the Rockefeller Foundation. The Foundation has appropriated $100,000 to start the plan, which developed from a suggestion made, just before he died, by Lord Lothian, then British Ambassador to the United States.

After completion of their studies, the students will return to England. Some of the 25 leading medical schools in the United States and Canada which have readily agreed to accept these students have offered to remit their tuition. A possible extension of the plan will be considered if the first year's experience is successful.

Efforts to salvage as much as possible of the world's productive scholarship by aid to refugee scholars of continental Europe, begun by the Foundation in 1933, continues. During the year 1940, 56 refugee scholars received grants totalling $266,350.

Science News Letter, April 5, 1941

NCE FIELDS

ANTHROPOLOGY

Java Ape-Man Discoverer Reported To Be Dead

DR. EUGENE DUBOIS, famous for his discovery, 50 years ago, of the first-found skull of the Java ape-man, *Pithecanthropus erectus,* died in December at his home in the Netherlands, it is stated in mailed reports belatedly reaching here by way of Germany and England. Dr. Dubois was 82 years of age.

Dr. Dubois achieved fame in 1891, when he discovered the top of a remarkable skull apparently intermediate between ape and man, together with two molar teeth and a thighbone, in a river gravel stratum near Trinil, in Java, where he was serving as an army surgeon. Subsequently, he returned to the University of Leyden, in the Netherlands where he spent much of his time until his death in research on his sensational and much-discussed fossil finds.

In recent years four additional Pithecanthropus finds have been made, principally through the activities of Dr. G. H. R. von Koenigswald. Two of these, including one of a juvenile skull, are accepted only tentatively, states Dr. Ales Hrdlicka of the U. S. National Museum; the other two, however, are considered undoubtedly authentic.

Science News Letter, April 5, 1941

PHYSICS

With a Fourth on Defense, Need Still More Physicists

EVEN though about a quarter of the nation's physicists are now working on problems of national defense, still more are needed. The situation is made difficult by the fact that a large number of graduate students now studying are in danger of being drafted, which threatens to reduce to half the number of 130 per year who have recently been completing their studies.

These facts are contained in the report of Dr. Henry A. Barton, director of the American Institute of Physics, to the governing board of the Institute. (*Science,* March 21.)

Dr. Barton estimates that 1,400 physicists are now engaged in defense problems of various kinds. Some are actually with the navy, army, air corps and other government departments, while others are in industries, or are performing defense research tasks in their own laboratories. There are between 4,000 and 6,000 physicists in the United States, depending on how one defines the word. There are 4,100 who are members of at least one of the national professional societies in physics.

Since the training of a physicist requires three to four years of graduate study, he said, it is nearly impossible to increase quickly their numbers. Every effort should be made to keep up training for these students despite the fact that many are unmarried and of draft age. The problem is further complicated by the fact that many of the best teachers have themselves been called away from their classrooms.

Science News Letter, April 5, 1941

GENERAL SCIENCE

Destruction of Collections Makes Ours More Valuable

DESTRUCTION, scattering and isolation, brought by war to the principal scientific collections of the Old World, enhance the importance of similar collections in American museums and universities. The 17 million specimens in the Smithsonian Institution's natural history collections, comprising everything from pressed wildflowers to human skulls, take on increased significance as scholars become unable to travel abroad in normal fashion.

When a scientist discovers a new species of plant or animal, he deposits a representative specimen—usually the first specimen collected—in one of the larger museums. This is known as the type specimen. It is used for comparison with other specimens collected later, to make absolutely certain of their identity.

Many of the type specimens in Old World collections have already been destroyed; others have been removed and hidden in safe places. But even where they have thus escaped destruction they are not at present available for study. Furthermore, practically all important collections in continental Europe are out of reach of American and British scientists, as the collections in Britain and America are unavailable to Continental scholars.

In this confused and abnormal world, the scientific collections in American museums and universities constitute oases in a flaming desert of war.

Science News Letter, April 5, 1941

ARCHAEOLOGY

Big Tower of Jerusalem's Third Wall Unearthed

ARCHAEOLOGISTS digging in Jerusalem have discovered a remarkably large tower of the famous Third Wall, built to fortify the city soon after Christ's death, is the report which has just reached the American Friends of the Hebrew University in New York.

The tower, 65 feet long and 24 feet wide, and a new section of the buried wall have come to light in excavations which Prof. L. A. Mayer and Prof. E. L. Sukenik of the Hebrew University are making in cooperation with the American School of Oriental Research.

The line of the ancient fortifications of the Holy City has been traced across the grounds that now belong to the American School's buildings, in northern Jerusalem. The new finds mark the eastern limit of the wall and indicate its turn southward close to the slope of the Kedron Valley.

Great importance is attached by Bible scholars to each new revelation of the route of the ancient walls of Jerusalem, for the help the walls may afford in precisely locating famous sites. The first wall was built by King David and Solomon. The second was the wall of Christ's day. The third, now being studied, was built by the Jewish King Herod Agrippa to enclose a large area north of the older city.

Science News Letter, April 5, 1941

ORNITHOLOGY

Outbreak of Pigeon Malaria Occurs in California

PIGEON MALARIA, hitherto unknown in California though present in other parts of the country, has been discovered on a Southern California squab farm by Prof. Carl G. Kadner of Loyola University. (*Science,* March 21) Prof. Kadner states that the parasites causing the disease were found when he was asked to examine squabs that showed signs of unthriftiness. Extent of the outbreak is not known, and a survey is in progress.

Pigeon malaria, which is capable of causing serious losses to commercial squab farms, is transmitted through the bite of a species of bloodsucking fly of foreign origin, which got into the United States in 1896 and is now distributed throughout the southern states and in California.

Science News Letter, April 5, 1941

PUBLIC HEALTH

New Method of Using Height And Weight Appraises Health

Efforts To Improve Health of American Youth, Spurred By Defense Program, Facilitated By New Technique

THE PHYSICAL fitness of boys and girls between two and 20 years of age can now be reliably and quickly appraised by a new method of using height and weight figures. The method, which fills a need felt for over a century by physicians, school and child health authorities and military authorities, was developed by Dr. Norman C. Wetzel, of Western Reserve University School of Medicine. (*Journal, American Medical Association,* March 22.)

Efforts to improve the health of American youth, quickened by the spur of national defense preparations, can go forward with increased speed by the use of this method. With more than 40,000,000 boys and girls under 20 years of age in this country, health improvement programs are delayed at the very start by the vast number of examinations that must be made to find all the boys and girls needing better diet or medical care. Dr. Wetzel's grid method for using height and weight measurements alone enables the medical examiner to tell at a glance, the editor of the journal points out, whether a child "is safely situated in a channel where its nutrition cannot be seriously questioned or whether it belongs to the abnormal groups."

Tests on several thousand Cleveland school children show the method to be 94% reliable in picking out the children whom experienced examiners call "poorly nourished" or "borderline."

The method shows any tendencies toward abnormal growth or development at an early stage, when the abnormalities can be most readily corrected. It has the advantage, also, of giving information in an objective way, making it most suitable for large surveys of the physical status of millions of children. Such surveys have heretofore been unstatisfactory because medical examiners have used different indices of physical fitness and there has been no general agreement on which was most reliable.

Science News Letter, April 5, 1941

PSYCHOLOGY—PHYSIOLOGY

Studying Anesthetic Effects Of Gasoline Vapors

THE HIGH SPIRITS and talkativeness induced by inhalations of alcoholic vapors are also elicited by inhaling the vapors of pure gasoline, Dr. A. C. Cornsweet, University of North Carolina psycho-physiologist, has found from experiments made on himself.

The opposite effects of sullenness and combativeness might also ensue from inhaling gasoline vapors, as alcohol has contrary effects on people.

Dr. Cornsweet's experiments were not done as a stunt. They are part of a long-time study he has been making of the effects of various anesthetics. This study brought him considerable notice two years ago when he used the vapors of alcohol to anesthetize a group of experimental animals.

As an anesthetic for white rats, purified gasoline vapors, Dr. Cornsweet found, is superior to ether, chloroform and "laughing gas" in regard to time requirements for anesthetization and recovery. The gasoline vapors anesthetized the rats with a rapidity second only to cyclopropane.

Dr. Cornsweet's report of the controlled experiment on himself with gasoline is as follows:

"The inhalation of the gasoline vapors seem to follow and elicit similar symptoms to that of alcohol in its vaporous state, a hyperactivity, desire for conversation, and euphoria. Like alcohol, or the other anesthetics, it perhaps will have contrary effects, as some people become combative, sullen, or boisterous and effusive. Its predictive value over several "shots" of alcohol is still in the experimental stage. It must be remembered that the gasoline is administered in a volatile state."

In the white rat experiments, Dr. Cornsweet found that after recovering consciousness the animals showed hearty appetites and absolutely no ill effects of their experience.

Like other anesthetics, gasoline vapors caused unconsciousness to proceed from tail to head—a caudo-cephalic sequence—with recovery in a directly opposite pattern, from head to tail.

But the difference in effects of gasoline from other types of vapor lay in the fact that the animals also lost and recovered consciousness "uni-laterally"—one complete side losing and recovering consciousness before the other.

In human beings, Dr. Cornsweet stated, recovery and induction is exactly the reverse of animals.

Superiority of unleaded gasoline was also exhibited in the complete lack of nausea as an after-effect. All other anesthetics did produce nausea, as exhibited in a lack of appetite, "grogginess," and other general symptoms of "hangover."

Science News Letter, April 5, 1941

METALLURGY

"Impurities" in Copper Make Roofs Wear Longer

THE purest copper, made by modern electrolytic processes does not wear as long when used for roofing purposes as the old-fashioned fire-refined copper produced for centuries. Reason is that certain of the "impurities" were actually beneficial in reducing wear. Consequently, one large copper manufacturer is deliberately introducing these elements, to give a copper roofing which should stand up as well as the old material did. (*Revere Copper and Brass, Inc., N. Y. C.*)

Science News Letter, April 5, 1941

● RADIO

Dr. Irvin Stewart, secretary to the National Defense Research Committee, will discuss the part of the Committee in the defense program as guest scientist with Watson Davis, director of Science Service, on "Adventures in Science," over the coast to coast network of the Columbia Broadcasting System, Thursday, April 10, 3:45 p.m. EST, 2:45 CST, 1:45 MST, 12:45 PST. Listen in on your local station. Listen in each Thursday.

BIOLOGY

Swarming Sea Worms

Solitary Creatures, Living Buried in Rocks and Dark, Swarm at Certain Phases of Moon and Lay Their Eggs

THREADS of silvery moonbeams over tropic seas are woven intricately into the complex fabric of life on earth.

The influence of the world's cold satellite, nearly a quarter million miles away, is most remarkably exemplified in the behavior of five or six varieties of sea worms whose life histories have been studied by several investigators at the Tortugas Laboratory of the Carnegie Institution of Washington.

Sea worms are solitary creatures who live most of the time buried in rocks and darkness. At certain phases of the moon they emerge from their burrows in a strange fashion, their bodies break apart, and the rear portions swim to the surface, lay their eggs in great masses on the water, and then perish. At the proper time of the year they respond to the intensity of moonlight as though their bodies were millions of photoelectric cells.

There are few more specific reactions in living nature than that of these lowly creatures to an irresistible influence which arises in them when the moonbeams penetrate the water. The pale moon seemingly becomes the activator of mystical forces of birth and death in uncountable swarms of these sea worms in whom life is a low-burning fire, probably far below the level of consciousness.

Many biologists have studied this strange phenomenon in their attempts to establish the point of contact between the lunar cycle and life. The life histories of the worms have been followed in intimate detail. The latest results, which throw considerable new light on the behavior of the lowly animals, have recently been reported by Drs. Leonard B. Clark and Walter N. Hess, of Union and Hamilton Colleges respectively, guest investigators at Tortugas.

They worked with the Atlantic palolo worm, one of the most conspicuous of the "moon worms." It is a close relative of the Pacific palolo worm which used to be eaten by the natives of the Samoan Islands, whence it derives its name.

The Atlantic palolo worm, *Leodice fucata,* is widely distributed in the West Indies. It has been reported from the Dry Tortugas Islands, Puerto Rico, Cape Florida, Jamaica, Tobago Bay and the Bahamas. The worms live in crevices and burrows in dead coral or in limestone beach rock from the lower levels of the intertidal zone to depths of about 150 fathoms.

They can excavate their own burrows, but usually incorporate into them cavities and tunnels made by other organisms, such as burrowing mollusks. Although the rock may be honeycombed and yield as many as twenty worms per cubic foot, the burrows do not seem to communicate.

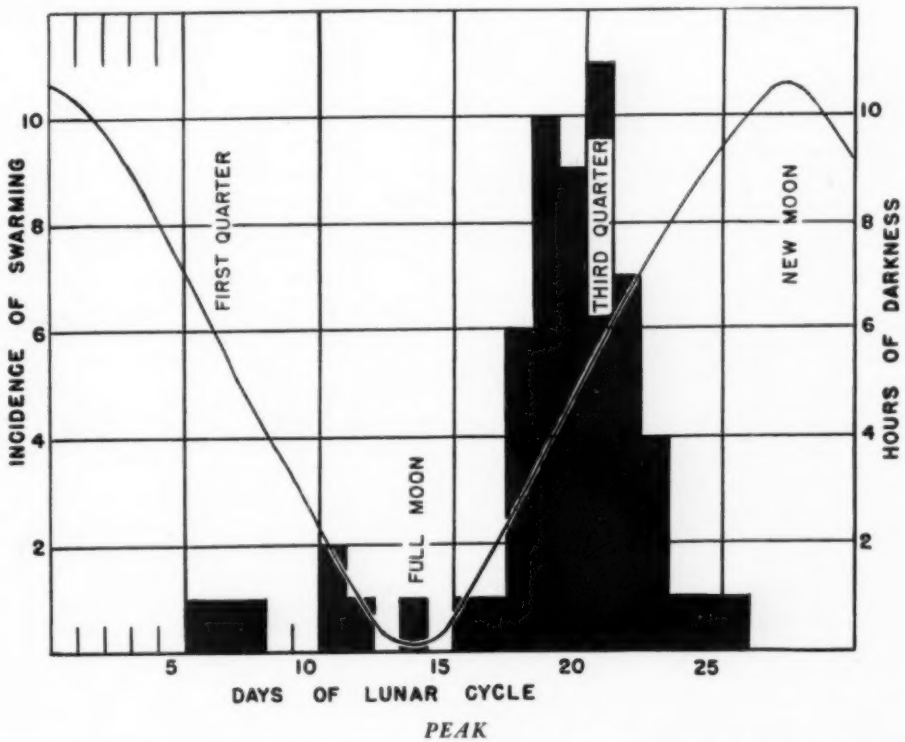
The worms remain in their burrows during the day. They have an extreme withdrawal reaction to all except very weak intensities of light. At night the front end is protruded into the water. The food consists largely of small particles of organic matter secured within a few inches of the mouth of the burrow.

During the night of swarming the worm backs out of its burrow and the rear half begins a series of convulsive twisting movements, usually counterclockwise, which eventually tear it apart from the front end. The front half crawls back into the burrow and continues to live as before. The freed rear half swims to the surface in a series of graceful, spiral movements. On a swarming night the numbers of swimming individuals increase rapidly until dawn, when the surface of the ocean is covered with them. With the rising of the sun they start releasing eggs and sperm into the water, and this may continue until the sun is about a half hour high.

The exhausted creatures may continue to swim for a short period unless eaten by fish, but they soon sink to the bottom and die, although in the laboratory it has been possible to keep them alive for as long as eight days.

After being discharged the eggs float and may appear in such immense numbers that they cover the ocean for acres. They have been observed in long windrows, several yards in width and several feet in depth. There are many thousand eggs per bucketful of water.

The eggs are fertilized immediately and proceed through their cleavage stages,



This chart shows the relation of the swarming of the Atlantic palolo worm to the lunar cycle.

so that by 10 a.m. they may be in a late stage of segmentation. By late evening or the next morning they have become well developed larvae, swimming about with a spiral motion. For three days they remain on the surface. Then they sink.

The studies of Drs. Clark and Hess show that the relation of the swarming reaction to moonlight is not quite so specific as has been assumed in the past, and that the maturity of the animal and the turbulence of the water play significant roles. The specificity remains such, however, as to constitute one of the true wonders of nature.

The swarmings, they report, may occur sporadically at almost any time during the moon's cycle except at the new moon. However, there is usually a significant increase at the first or third quarter phase of the cycle. Major swarms, during which many more worms reproduce than at all other times together, nearly always occur within five days of the third quarter moon.

The moon's phases undoubtedly are significant. Swarming about the quarter moon phases may be due to inhibition at other periods or may be due to a stimulus exerted at the quarters and not at other times. However, the actual presence of moonlight is not necessary to initiate swarming, so the events must be influenced by the moon before that time.

The influence, possibly stimulatory, exerted by the first and third lunar phases seems to differ in intensity in the two quarters. Reports are rare of swarming at the first as compared with the third quarter moon. Swarming has taken place many times at the third quarter on dates preceding the date of the earliest recorded swarm on the first quarter. In no case has swarming occurred in the first quarter less than 369 days from the swarm of the preceding year, while worms have swarmed at the third quarter moon at 353 days.

Waves Prevent Swarming

Among the other conditions which must obtain is quiet water. Wave action and water turbulence prevent swarming at the Dry Tortugas Islands if the wind has a velocity greater than eight miles an hour, unless the water is sheltered. Even after a swarm is begun wind may cause sufficient wave action to cause its cessation. Tides, to the extent that they induce or modify currents or change the depth of water, also may play some part in determining swarming.

It is almost impossible to keep these worms alive in aquaria where their strange life could be studied under controlled conditions. They are extremely sensitive to lack of circulation, to any accumulation of carbon dioxide in the water, and to any impurities. If small pieces of rock containing the creatures are put in laboratory tanks, the captives die within a very few days, even though a flow of water is maintained sufficient to give them a complete change every fifteen minutes.

It was hoped that a method could be developed by which mature worms could be removed from their burrows alive and put into aquaria. Attempts were made to drive them out by drying the rocks, putting them in warm water, and by weak electric currents. All failed completely. Few other creatures have such a remarkable power of breaking apart. They have a highly developed instinct to cling to rock, known to naturalists as "positive thigmotropism." Almost any stimulus which is strong enough to overcome this tendency also is sufficient to cause a worm to fragment.

Extremely Sensitive to Light

Also, Drs. Clark and Hess point out, the rear portion of the worm is extremely sensitive to light and usually starts twisting movements when exposed, so that it is quickly broken off and may be broken into several pieces. A measure of success was attained by breaking open the rocks with a cold chisel. It was necessary to work in dim light, as at dusk, and to expose the worm completely with one blow. If any part of the creature, especially the front end, remains in the burrow it crawls in, and even the gentlest pulling causes it to break. Very often the weight of part of the worm is sufficient to cause breaking.

With practice it was found possible to remove about five per cent of the mature worms unbroken from their burrows. They did not live free in aquaria even in a dark room. Various attempts were made to keep them in glass tubes covered with rubber, but without success. The worms entered the tubes readily and remained in them during the daytime, but left them at night and did not find their way back. At sunrise they were so stimulated that they fragmented.

The rear ends, if broken out of the rocks, behave much like those in the process of swarming, if the light is more than half a foot candle. They twist, break away, and swim at the surface. Worms broken out of rocks in the dark do not react in this way, but once the reaction has been started darkness does not inhibit it.

As the season for swarming approaches, the two biologists found, certain important changes occur in the animal. The rear half of the male becomes a deep pink in color and that of the female a greenish-gray. The two or three front segments of this half are constricted so that they are easily ruptured.

Generally the life of the secretive moon worms is far removed from any influence on human affairs, although it doubtless fills an appropriate niche in the economy of nature. Once, however, a related species of the Bahamas, the Odontosyllis, may have played a role in history in connection with Columbus' landing.

It will be remembered that at about 10 p.m., October 11, 1492, Columbus and several others, standing on the poop on the *Santa Maria,* saw a mysterious light flashing in the distance. It was described as "like the flame of a small candle, alternately raised and lowered." Navigators who have charted Columbus' course have calculated that the *Santa Maria* at that time was about 35 miles eastward and to the windward of the spot where the actual landing was made.

The light might have been, according to a recent speculation of L. R. Crawshay, British biologist, published in *Nature,* the luminescence of this worm. The swarming displays are intermittent, with short periods of excessive and declining brilliance. The whole phenomenon lasts from five to ten minutes. Seen from a distance of a few hundred yards it would have the appearance of a candle being raised and lowered. The difficulty is that the light could not have been seen thirty-five miles at sea since the worm only displays its light in shallow water, and then only at low tide.

Must Have Been Shallow

Assuming that this was the light seen by Columbus, the *Santa Maria* could not have been in the deep water thirty-five miles to the eastward of Watling Island. It must have been, on the contrary, near the narrow, rocky bank extending about three and one-half miles off the north shore of Watling Island. This is an ideal swarming place for the worms.

Hence, if Mr. Crawshay's speculation is correct, the *Santa Maria* was probably just off the northern tip of Watling Island at ten o'clock on the evening of October 11, 1492, when the mysterious light was sighted. If this were so the landing made the next morning must have been at Cat Island, not at Watling.

Thus the mute testimony of a worm may serve to fix an important point in the world's history. All this, however, is admittedly highly speculative, and most historians accept Watling Island.

PHYSICS

Newest Atom-Smasher Is Nearing Completion

See Front Cover

NEWEST in the rapidly growing family of atom-smashers is the eight-million-volt electrostatic generator nearing completion at the University of Notre Dame. Previous generators of this kind, erected at the University of Pennsylvania, the Carnegie Institution of Washington's Department of Terrestrial Magnetism, the Westinghouse Research Laboratories, etc., have been arranged vertically, but this one, planned by Dr. George B. Collins, is horizontal.

The new generator, which will operate under air or gas pressure approximately ten times as great as that of the atmosphere, resembles a railroad "tank car" and an addition to the university's science building was necessary to house the twenty-ton steel container, forty feet long, in which the apparatus is contained. One section is mounted on wheels, so that the generator proper is accessible for inspection or repairs. Freon gas, the same used in many refrigerators, will also be forced into the tank to improve its operation.

The illustration on the cover of this SCIENCE NEWS LETTER shows the interior of the structure. Charged particles will be driven at enormous speeds down the white porcelain tube. The closely placed aluminum rings around each column prevent sparking from taking place along these supports.

Science News Letter, April 5, 1941

A *meteorite* weighing 320 pounds was set up at a Texas trail junction by Comanche Indians, and offerings of beads, pipes and tobacco were left to the mysterious object by those who passed.

Don't Delay

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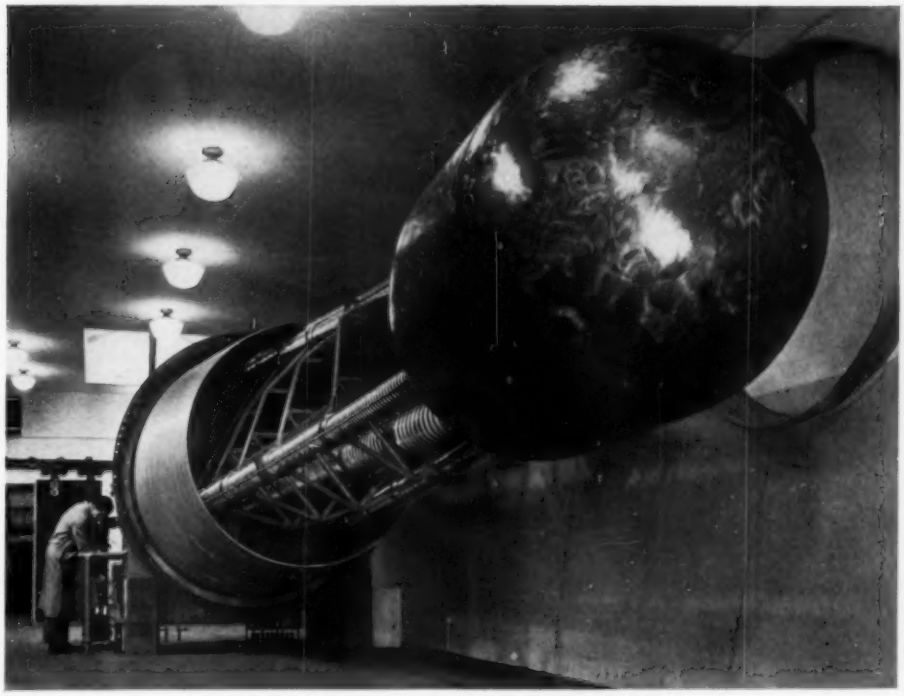

ATOM SMASHER

When this eight-million-volt generator is completed at the University of Notre Dame, the X-rays from it will be the most penetrating ever produced.

ASTRONOMY

Astronomy Hampered But Work Goes on Amid Bombs

THOUGH astronomical research in Europe, and on this side of the Atlantic as well, has been reduced by the war, some studies are continuing even in the belligerent countries and those now under Nazi domination, says Dr. Bart J. Bok, associate professor of astronomy, at the Harvard Observatory.

In a recent statement, he says that: "In spite of the many advances that have been made during the year 1940 one cannot help but notice the retarding influence of the war on astronomical progress, not only in Europe but also in the United States. The uncertainties and delays connected with the sending of mail across the Atlantic make it difficult to get a clear picture of the present state of astronomical research in war-torn Europe. Until a few months ago British astronomers continued to publish papers at a not-too-much reduced rate. The summer issues of the Monthly Notices of the Royal Astronomical Society contain several articles that must have required thought and concentration. The recent news of the bombing of the observatories in Greenwich and Edinburgh indicates that our British colleagues are now deeply involved.

"It has been more difficult to get a clear picture of what is happening in Germany. In spite of the war some German observatories appear still to be quite active. The current progress reports of the Observatories at Berlin, Hamburg, Potsdam and Breslau indicate that these

★★★★★★★★★★★★★

WYOMING

Fish in its mountain streams. Ride horseback thru its hills and canyons. Find Indian relics and marine fossils in this region of great historical and geologic interest.

The Patons welcome a limited number of guests at their ranch home in the Big Horn country. Cabins are comfortable, food good and horses gentle.

Write for illustrated folder with map

Paton Ranch, Shell, Wyoming

● Earth Trembles

Information collected by Science Service from seismological observatories resulted in the location by *the Coast and Geodetic Survey* of the following preliminary epicenter:

Friday, March 21, 2:58.4 a.m., EST

About 900 miles southwest of the Cape Verde Islands.

Latitude, about 7 degrees north. Longitude, 37 degrees west, on the mid-Atlantic ridge. Sharp shock.

For stations cooperating with Science Service, the Coast and Geodetic Survey, and the Jesuit Seismological Association in reporting earthquakes recorded on their seismographs, see *SNL, Feb. 22.*

are continuing with pure research at perhaps half the pre-war rate.

"The Blitzkrieg of the spring of 1940 had originally a paralyzing effect on research in Scandinavia, the low countries and France, but recent reports indicate that many astronomers in these parts of Europe are returning, perhaps as an escape from political uncertainties, to their own fields of research.

"So far as it is now known in this country, very few astronomers have been killed in action in the air, on the ground or at sea."

Science News Letter, April 5, 1941

ICHTHYOLOGY

Electric Traffic Control for Fish

A TRAFFIC-CONTROL device for fish is the object of patent 2,233,045 granted to F. S. Bonner of Kootenai, Idaho, and M. R. Miller of Huntington Park, Calif. It consists essentially of a gate-like structure which is placed athwart the stream or irrigation ditch from which the fish are to be barred. Contact of the fish's body with bars of the gate turns on an electric current, not strong enough to kill or harm it, but delivering just enough of a shock to make said fish lose interest in going in that particular direction.

Science News Letter, April 5, 1941

PSYCHOLOGY

Good States Produce, But Rich States Attract the Able

Psychologist Urges Free Trade in Great Ability But Warns of Danger of Exporting Too Much

THE MOST able men and women in America are produced in states that excel as good places to live, but they are then distributed to the rich states and manufacturing states, Dr. Edward L. Thorndike, eminent psychologist and educator of Teachers College, Columbia University, told the American Academy of Arts and Sciences.

This is probably for the common good, Dr. Thorndike believes.

"There should be free trade between the states in great ability as in everything else," he said. "It would be deplorable if any state used its power to keep gifted persons in, as some states are now using their power to keep goods from other states out."

But a state that is steadily exporting great ability should be sure, Dr. Thorndike warned, that it is keeping all that it needs. This is particularly true of business and industrial ability.

The work of an able painter, composer, poet, scientist, inventor or philosopher, he explained, benefits all states just as much as the state where he resides. Such men will be the best judges of where they should go.

"The benefits from the work of an able engineer, manufacturer, banker, merchant, craftsman or farmer are more localized," he said. "They do ultimately and indirectly spread to all mankind, but their first and direct action is upon the communities where they operate. An enlightened self-interest in the citizens of a state will teach them to cherish these abilities especially.

"It is shameful for a state to stone its prophets in art and literature; it is both shameful and silly to stone its prophets in business and industry."

Dr. Thorndike traced the migrations of men of ability by studying men listed in Who's Who, American Men of Science, and Leaders in Education, noting where each was born and where he is now residing.

Then he gave to each state a score in general goodness—what he calls a "G score," which is a weighted average of 37 features of welfare (in 1930) including infant deathrate reversed, maternal deathrate reversed and other deathrates, items of expenditure for schools, teachers' salaries and books, percentage of persons sixteen to twenty attending schools, expenditures for recreation, rarity of poverty, infrequency of child labor, average wage, frequency of home ownership and per capita availability of such things as electricity, gas, automobiles, telephones and radios. Literacy, circulation of certain magazines, ratio of value of school to value of jails were some of the other items considered in estimating this goodness of life.

The three states highest in Dr. Thorndike's G score are California, Connecticut and Washington.

Dr. Thorndike explodes the popular idea that agricultural or rural communities produce the great majority of able men who are then "fed into the maw of industry, or sucked into the vortex of some metropolis, or sacrificed on the altar of capitalistic production."

Agricultural states actually do not produce quite their share of the able, and they fail relatively to retain them or to attract them.

Science News Letter, April 5, 1941

Flies are shortsighted.

In 100 years, from 1840 to 1940, the average *fleece* sheared from sheep in the United States increased from two pounds to eight.

King Herod's fortress in *Jerusalem* was named Antonia Fortress to honor Mark Antony.

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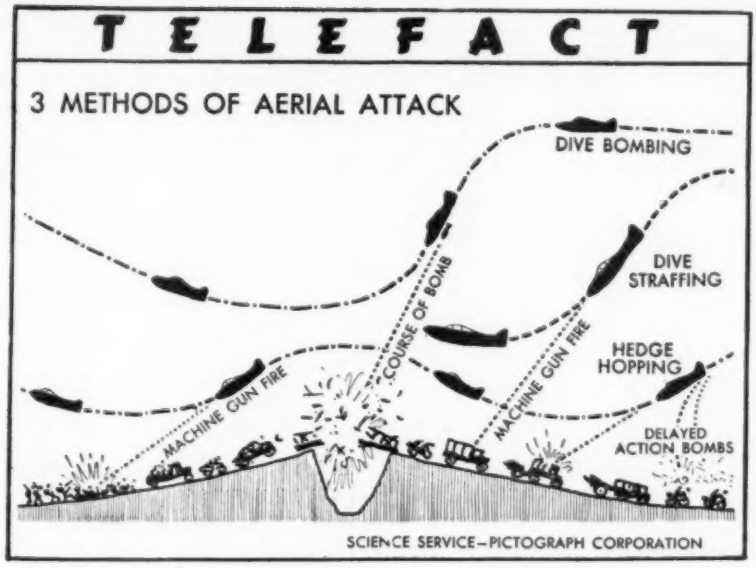

PUBLIC HEALTH

Mist of Propylene Glycol Effective in Sterilizing Air

AN ODORLESS, unnoticeable mist of propylene glycol sprayed into the air may be the answer to the long search for a practical way of preventing the spread of diseases like influenza in places where many people must be crowded together.

The propylene glycol mist effectively sterilizes the air, Drs. O. H. Robertson, Edward Bigg, Benjamin F. Miller and Zelma Baker, of the University of Chicago Medical School, report. (*Science*, Feb. 28.)

The germ-killing effect of the mist was tested both by spraying it onto bacteria and by spraying bacteria into the mist. The test conditions were thus equivalent to those in which bacteria get into the air either through ordinary breathing or by sneezing or coughing.

The effectiveness of the mist, it is said, comes from the fact that each droplet contains the same concentration of the chemical as does the parent solution, and therefore the anti-bacterial agent is enabled to act in high concentration on bacteria suspended in the air. The mist is reported to maintain its effectiveness for an hour and a half or more.

The chemical, propylene glycol, is said to have no poisonous effect on humans in the quantities used, and the mist does not appear to stain or cause a noticeable film.

Spread of disease in air raid shelters, barracks, industrial plants, sick rooms, and crowded meeting and housing places might be cut down or prevented by the use of this mist, it is suggested, although its effectiveness in reducing cases of colds, influenza, pneumonia and the like cannot be gauged accurately until extensive clinical studies have been made.

The mist or aerosol method of sterilizing the air is likely, it is said, to be more effective and less costly than ultraviolet ray equipment which has recently been used to kill germs in the air of hospital operating rooms and nurseries.

Science News Letter, April 5, 1941

PSYCHIATRY

Simple Drugs Are Often To Blame for Mental Ills

SIMPLE remedies that you can buy at the corner drug store—bromides and barbiturates — are more often to blame for mental disease than are heroin, opium or even morphine.

This fact, which will come as a surprise to most people, is revealed by Dr. Merrill Moore, poet and physician who, with Dr. M. G. Gray, has made a study of 124 drug addict-psychotic patients treated in Boston Psychopathic Hospital over a period of 12 years.

Heading the list of drugs taken by the addicts were the bromides. Altogether 42 patients were addicted to this sedative. Next came the barbiturates—39 persons had been taking these sleeping drugs. Then morphine with 26 addicts. Some took a common headache pill. One was addicted to turpentine.

Most of the patients used the drugs as self-medication. They were sleepless, nervous, or in pain. They were depressed, or had sexual, marital or financial difficulties. A few were exposed by their occupation, as in the case of men who were rubber workers and suffering from lead poisoning.

It is not well understood why only a few persons using these drugs develop mental disease, these physicians said. (*Journal of Criminal Psychopathology.*) In some cases it seems due to individual peculiarities. They urge a further study of the psychological make-up of the patients who develop drug addiction and intoxication.

The problem of drug psychoses is, they conclude, relatively unimportant compared to that of the mental diseases arising from alcoholism. The number of cases of alcoholic psychoses in this same period studied was eight times as great as the drug psychoses. And a great many of those suffering from drug psychoses also took alcohol in excess combined with their drug or drugs.

Science News Letter, April 5, 1941

RADIO

Radio Direction Finder Made For Small Boats

MORE small boats this year will be able to find their way home in fog if they are provided with a new inexpensive radio direction finder, that tells within a degree the bearing of marine beacon stations. The entire device weighs 17 pounds, and is complete with batteries and headphones. (*Ansley Radio Corp., N. Y. C.*)

Science News Letter, April 5, 1941

One sheep's coat may contain more than a dozen grades of *wool*.

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NATURE STUDY

NATURE NOTES—John Kieran—*Doubleday, Doran,* 112 p., illus., $1.50. Brief, breezy bits of information about living things of the out-of-doors, well illustrated with neat wash drawings. The author is a member of the New York *Times* editorial staff, better known perhaps through his regular participation in the popular radio program, "Information Please."

Science News Letter, April 5, 1941

CHEMISTRY

CHEMICAL SPECIES — Jean Timmermans; trans. by Ralph E. Oesper—*Chemical Pub. Co.,* 177 p., $4. A discussion of the principles by which the best may be taken from a mass of physical data.

Science News Letter, April 5, 1941

MATHEMATICS

ELEMENTS OF CALCULUS — Abraham Cohen—*Heath,* 583 p., $3.50. This new college text contains somewhat more material than is needed for the usual introductory course because, the author states, it is much easier to omit certain parts from a book than to supply missing material from outside sources. By reason of this completeness, the book should be a good one for the person who wishes to review the calculus.

Science News Letter, April 5, 1941

ENGINEERING

MASTERING MOMENTUM — Lewis K. Sillcox — *Simmons-Boardman,* 274 p., illus., $2.50. With the energy of a moving system increasing as the square of the velocity, its control becomes especially important in the modern high speed trains; and braking methods, for example, must be restudied. Dr. Sillcox discusses these trends, and their influence on American railway equipment.

Science News Letter, April 5, 1941

CHEMISTRY

THE APPLICATIONS OF CHEMICAL ENGINEERING—Harry McCormack, ed.—*Van Nostrand,* 431 p., illus., $3.75. This is a cooperative effort, with many authorities contributing to create a practical laboratory manual in chemical engineering. It covers such topics as measurement of temperature, the flow of fluids, distillation, and gas absorption.

Science News Letter, April 5, 1941

TECHNOLOGY—BIBLIOGRAPHY

TRADE-NAMES INDEX—*Special Libraries Assoc.,* 178 p., $4. This comprehensive list of trade names from the files of the Technology Department of the Carnegie Library of Pittsburgh, now available for librarians and national defense workers all over the country, should be particularly valuable at the present time. It has been supplemented by a classified bibliography of sources for trade-names, trade-marks and brand names, appearing in the second part of the volume.

Science News Letter, April 5, 1941

EDUCATION

CALIFORNIA TEST OF PERSONALITY; Primary, for kindergarten and grades 1 to 3; Elementary, for grades 4 to 8; Intermediate, grades 7 to 10, or junior high school ages; Secondary, for high school and college students; and Adult.—Willis W. Clark, Ernest W. Tiegs and Louis P. Thorpe—*Calif. Test Bureau, Los Angeles, Calif.* For each series, per 25 tests, $1; Specimen set, 25c.

Science News Letter, April 5, 1941

MEDICINE

STUDIES ON TUBERCULOSIS—E. Joyce Saward and others—*Johns Hopkins Press,* 198 p., $1.10 (American Journal of Hygiene Monographic Series, No. 16). Public health workers, sociologists and scientists working in the tuberculosis field will be interested in these studies on tuberculosis in Negro families in Jamaica, B. W. I. and in Negro and white families in Alabama.

Science News Letter, April 5, 1941

TECHNOLOGY

COLORING, FINISHING AND PAINTING WOOD—Adnah Clifton Newell—*Manual Arts Press,* 480 p., illus., $4.50. In this new and enlarged edition of a very useful work, six chapters, including one on the finishing of metal, have been added.

Science News Letter, April 5, 1941

GEOGRAPHY

ECONOMIC GEOGRAPHY, A Regional Survey (4th. ed.)—R. H. Whitbeck and V. C. Finch—*McGraw-Hill,* 647 p., illus., $3.50. A revision of a very well-known text, with much new material. Nearly half of the book is devoted to the United States and Canada, and the rest, chapter by chapter, covers other countries.

Science News Letter, April 5, 1941

MEDICINE

DOCTOR IN ARABIA — Paul W. Harrison—*John Day Co.,* 303 p., $3. Good reading for those who like medical adventure stories.

Science News Letter, April 5, 1941

PSYCHIATRY

THE MASK OF SANITY, An Attempt to Reinterpret the So-called Psychopathic Personality—Hervey Cleckley — *Mosby,* 298 p., $3. Many laymen with an interest in things medical will be entertained by the part of this book devoted to case histories and discussions of psychopathic personalities in literature. The book was written, however, with a more serious purpose than entertaining the public with medical drama. The author's purpose is to call attention to the large numbers of psychopathic personalities in the world, the tremendous problem they represent, and the need for finding a better way of handling them than is now available.

Science News Letter, April 5, 1941

GEOGRAPHY

WISCONSIN, A Guide to the Badger State — *Writers' Program, Wisconsin W. P. A.*—651 p., illus., $2.75. Quantities of fine illustrations are the first impression, as you open this newest volume in the American Guide Series. These guidebook writers think of everything, down to giving brief hints on traffic peculiarities and telling where sports can be enjoyed in various cities. And, of course, there is a wealth of state history and facts and figures.

Science News Letter, April 5, 1941

MINERALOGY

THE AMERICAN MINERS' ASSOCIATION, A Record of the Origin of Coal Miners' Unions in the United States—Edward A. Wieck—*Russell Sage Foundation,* 330 p., $2. The American Miners' Association rose in the early 1860's and was the first American miner's union. Mr. Wieck, now a research associate of the Department of Industrial Studies of the Russell Sage Foundation, was himself a miner for 25 years as well as a union official and delegate, excellent preparation for such a study as this.

Science News Letter, April 5, 1941

PSYCHIATRY

THE THERAPY OF THE NEUROSES AND PSYCHOSES, a Socio-Psycho-Biologic Analysis and Resynthesis—Samuel Henry Kraines—Lea & Febiger, 512 p., $5.50. Intended as a practical book for the use of the general practitioner in caring for his medical cases which may involve some psychic distress. Every physician has neurotics among his patients. He will find here a description of symptoms and recommended treatment.

Science News Letter, April 5, 1941